THE ASTROPHYSICAL JOURNAL

Founded in 1895 by George E. Hale and James E. Keeler

HELMUT A. ABT
Editor-in-Chief
Kitt Peak National Observatory

Scientific Editors

GREGORY D. BOTHUN
University of Oregon

GEOFFREY BURBIDGE
University of California, San Diego

ANNE P. COWLEY
Arizona State University

BERNHARD M. HAISCH
Solar and Astrophysics Lab., Lockheed Martin

STEVEN N. SHORE
Indiana University, South Bend

EDWARD M. SION
Villanova University

CHRISTOPHER SNEDEN
University of Texas

YERVANT TERZIAN
Cornell University

JOHN H. THOMAS
University of Rochester

VIRGINIA TRIMBLE
University of Maryland and University of California, Irvine

STEVEN P. WILLNER
Smithsonian Astrophysical Observatory

EDWARD L. WRIGHT
University of California, Los Angeles

A. DALGARNO
Letters Editor
Center for Astrophysics

EUGENE H. AVRETT
Deputy Letters Editor
Center for Astrophysics

AAS PUBLICATIONS BOARD

ROBERT J. HANISCH (1996–1999), *Chairperson*
Space Telescope Science Institute

JAMES J. CONDON (1994–1997)
NRAO, Charlottesville, Virginia

JOHN A. NOUSEK (1994–1997)
Pennsylvania State University

MOSHE ELITZUR (1995–1998)
University of Kentucky

DIMITRI M. MIHALAS (1996–1999)
University of Illinois

KAREN S. BJORKMAN (1996–1999)
University of Toledo

SUSAN TEREBEY (1997–2000)
California Institute of Technology

Publication Manager: Julie Steffen
Production Manager: Kim Langford
Chief Manuscript Editor: Geraldine Brady
Manuscript Editors: Walter G. Glascoff III, Beth Garrison, Thad A. Doria, Greg M. Hajek, Paul Ruich, Ivan Brunetti, Sharon Jennings, Maureen E. Callahan, Stephanie O. Nevins, Baharé Rashidi, and Elizabeth Huyck
Electronic Publishing Coordinators: Sara Zimmerman and John Myer
Production Staff: Cindy Garrett, Carolyn B. Chmiel, Emily Clark, Suchitra Gururaj, and Elissa Park
Tucson Editorial Office: Janice Sexton, Alice Prochnow, Candace M. Hauser, Marlene Saltzman, Cheyenne Ross, and Rachel Williams

VOLUME 484, PART 1
1997 JULY 20 AND AUGUST 1

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS FOR
THE AMERICAN ASTRONOMICAL SOCIETY

© 1997 BY THE AMERICAN ASTRONOMICAL SOCIETY. ALL RIGHTS RESERVED.

PUBLISHED THREE TIMES A MONTH

COMPOSED BY SANTYPE INTERNATIONAL LIMITED, SALISBURY, ENGLAND
PRINTED BY CAPITAL CITY PRESS, INC.
MONTPELIER, VERMONT, U.S.A.

THE ASTROPHYSICAL JOURNAL

CONTENTS OF VOLUME 484, PART 1

1997 JULY 20, Number 1

Page

THE EFFECT OF WEAK GRAVITATIONAL LENSING ON THE COSMIC MICROWAVE BACKGROUND ANISOTROPY: FLAT VERSUS OPEN UNIVERSE MODELS 1
Enrique Martínez-González, Jose L. Sanz, & Laura Cayón

UCSB SOUTH POLE 1994 COSMIC MICROWAVE BACKGROUND ANISOTROPY MEASUREMENT CONSTRAINTS ON OPEN AND FLAT-Λ COLD DARK MATTER COSMOGONIES 7
Ken Ganga, Bharat Ratra, Joshua O. Gundersen, & Naoshi Sugiyama

THE POPULATION OF DAMPED Lyα AND LYMAN LIMIT SYSTEMS IN THE COLD DARK MATTER MODEL 31
Jeffrey P. Gardner, Neal Katz, Lars Hernquist, & David H. Weinberg

GAS AND DARK MATTER SPHERICAL DYNAMICS 40
Jean-Pierre Chièze, Romain Teyssier, & Jean-Michel Alimi

A POSSIBLE EFFECT OF THE PERIOD OF GALAXY FORMATION ON THE ANGULAR CORRELATION FUNCTION 53
Tomoya Ogawa, Boudewijn F. Roukema, & Kazuyuki Yamashita

A NOTE ON THE STATISTICAL MECHANICS OF VIOLENT RELAXATION OF PHASE-SPACE ELEMENTS OF DIFFERENT DENSITIES 58
A. Kull, R. A Treumann, & H. Böhringer

INFIMUM MICROLENSING AMPLIFICATION OF THE MAXIMUM NUMBER OF IMAGES OF *n*-POINT LENS SYSTEMS 63
Sun Hong Rhie

AN ESTIMATE OF H_0 FROM KECK SPECTROSCOPY OF THE GRAVITIATIONAL LENS SYSTEM 0957+561 70
Emilio E. Falco, Irwin I. Shapiro, Leonidas A. Moustakas, & Marc Davis

ON THE EFFECTS OF INCLUDING COUNTERROTATING ANGULAR MOMENTUM IN SIMULATIONS OF GALACTIC DISK SYSTEMS 79
Chad L. Davies & James H. Hunter, Jr.

A NEAR-INFRARED SEARCH FOR HIDDEN BROAD-LINE REGIONS IN ULTRALUMINOUS INFRARED GALAXIES 92
Sylvain Veilleux, D. B. Sanders, & D.-C. Kim

LEARNING ABOUT ACTIVE GALACTIC NUCLEUS JETS FROM SPECTRAL PROPERTIES OF BLAZARS 108
Marek Sikora, Greg Madejski, Rafał Moderski, & Juri Poutanen

A DRAMATIC MILLIMETER WAVELENGTH FLARE IN THE GAMMA-RAY BLAZAR NRAO 530 118
Geoffrey C. Bower, Donald C. Backer, Melvyn Wright, James R. Forster, Hugh D. Aller, & Margo F. Aller

EVIDENCE FOR ROTATION IN THE GALAXY AT $z = 3.15$ RESPONSIBLE FOR A DAMPED LYMAN-ALPHA ABSORPTION SYSTEM IN THE SPECTRUM OF Q2233+1310 131
Limin Lu, Wallace L. W. Sargent, & Thomas A. Barlow

EVIDENCE AGAINST BROAD ABSORPTION LINES IN THE X-RAY–BRIGHT QUASAR PG 1416−129 135
Paul J. Green, Thomas L. Aldcroft, Smita Mathur, & Norbert Schartel

X-RAY ABSORPTION TOWARD THE EINSTEIN RING SOURCE PKS 1830−211 140
Smita Mathur & Sunitá Nair

THE URSA MAJOR CLUSTER OF GALAXIES. II. BIMODALITY OF THE DISTRIBUTION OF CENTRAL SURFACE BRIGHTNESSES 145
R. Brent Tully & Marc A. W. Verheijen

THE HIGH-REDSHIFT RADIO GALAXY MRC 0406−244 163
Brian Rush, Patrick J. McCarthy, Ramana M. Athreya, & S. E. Persson

A NUMERICAL SIMULATION OF THE BRIGHTNESS VARIATIONS OF OJ 287 180
B. Sundelius, M. Wahde, H. J. Lehto, & M. J. Valtonen

Page

VLBA IMAGING OF NGC 4261: SYMMETRIC PARSEC-SCALE JETS AND THE INNER ACCRETION REGION 186
Dayton L. Jones & Ann E. Wehrle

PKS 0116+082: AN OPTICALLY VARIABLE COMPACT STEEP-SPECTRUM SOURCE IN A NARROW-LINE RADIO GALAXY 193
M. H. Cohen, R. C. Vermeulen, P. M. Ogle, H. D. Tran, & R. W. Goodrich

ARE FLOCCULENT SPIRALS DEVOID OF DENSITY WAVES? GAS MORPHOLOGY AND KINEMATICS IN NGC 5055 202
Michele D. Thornley & Lee G. Mundy

MID-INFRARED CONTINUUM OF STARBURST NUCLEI: CONTRIBUTION FROM HOT LARGE GRAINS WITHIN H II REGIONS? 222
Hideaki Mouri, Kimiaki Kawara, & Yoshiaki Taniguchi

BARNETT RELAXATION IN THERMALLY ROTATING GRAINS 230
A. Lazarian & W. G. Roberge

STABILITY OF SIMILARITY SOLUTIONS FOR A GRAVITATIONALLY CONTRACTING ISOTHERMAL SPHERE: CONVERGENCE TO THE LARSON-PENSTON SOLUTION 238
Tomoyuki Hanawa & Kunji Nakayama

X-RAY SHADOWS BY HIGH-LATITUDE MOLECULAR CLOUDS. I. CARTOGRAPHY 245
K. D. Kuntz, S. L. Snowden, & F. Verter

NEW PROTOSTELLAR COLLAPSE CANDIDATES: AN HCO^+ SURVEY OF THE CLASS 0 SOURCES 256
Erik M. Gregersen, Neal J. Evans II, Shudong Zhou, & Minho Choi

INTERACTION OF PLANETARY NEBULAE WITH A MAGNETIZED ISM 277
Noam Soker & Ruth Dgani

ANISOTROPIC BROAD NUCLEAR GAMMA-RAY LINES: APPLICATION TO THE COMPTEL OBSERVATIONS OF ORION 286
Benzion Kozlovsky, Reuven Ramaty, & Richard E. Lingenfelter

NEAR-INFRARED SPECTROSCOPY OF MOLECULAR FILAMENTS IN THE REFLECTION NEBULA NGC 7023 296
Paul Martini, K. Sellgren, & Joseph L. Hora

THE *ROSAT* HRI X-RAY SURVEY OF THE CYGNUS LOOP 304
N. A. Levenson, J. R. Graham, B. Aschenbach, W. P. Blair, W. Brinkmann, J.-U. Busser, R. Egger, R. A. Fesen, J. J. Hester, S. M. Kahn, R. I. Klein, C. F. McKee, R. Petre, R. Pisarksi, J. C. Raymond, & S. L. Snowden

SPECTRAL PROPERTIES OF ACCRETION DISKS AROUND BLACK HOLES. II. SUB-KEPLERIAN FLOWS WITH AND WITHOUT SHOCKS 313
Sandip K. Chakrabarti

CONSTRAINTS ON THE PRODUCTION OF ULTRA–HIGH-ENERGY COSMIC RAYS BY ISOLATED NEUTRON STARS 323
Aparna Venkatesan, M. Coleman Miller, & Angela V. Olinto

VARIATIONAL PRINCIPLES FOR STELLAR STRUCTURE 329
Dallas C. Kennedy & Sidney A. Bludman

POLARIZED EMISSION OF AM HERCULIS OBJECTS 341
Hussain Y. Rashed

A POSSIBLE SITE OF COSMIC RAY ACCELERATION IN THE SUPERNOVA REMNANT IC 443 350
Jonathan W. Keohane, R. Petre, Eric V. Gotthelf, M. Ozaki, & K. Koyama

CONVECTION, THERMAL BIFURCATION, AND THE COLORS OF A STARS 360
Theodore Simon & Wayne B. Landsman

GAMMA-RAY SPECTRA AND VARIABILITY OF CYGNUS X-1 OBSERVED BY BATSE 375
J. C. Ling, Wm. A. Wheaton, P. Wallyn, W. A. Mahoney, W. S. Paciesas, B. A. Harmon, G. J. Fishman, S. N. Zhang, & X. M. Hua

TEMPORAL PROPERTIES OF CYGNUS X-1 DURING THE SPECTRAL TRANSITIONS 383
Wei Cui, S. N. Zhang, W. Focke, & J. H. Swank

NEW PERSPECTIVES ON AX MONOCEROTIS 394
Nicholas M. Elias II, R. E. Wilson, Edward C. Olson, Jason P. Aufdenberg, Edward F. Guinan, Manuel Güdel, Walter V. van Hamme, & Heather L. Stevens

CONTENTS

Page

AN APPROXIMATION FOR THE rp-PROCESS 412
Felix Rembges, Christian Freiburghaus, Thomas Rauscher, Friedrich-Karl Thielemann, Hendrik Schatz, & Michael Wiescher

FAR-ULTRAVIOLET OBSERVATIONS WITH THE *VOYAGER* ULTRAVIOLET SPECTROMETER: NEW EVIDENCE FOR INTERACTING WINDS IN SYMBIOTIC SYSTEMS 424
P. S. Li & D. A. Leahy

LIMITS ON DECAMETRIC RADIATION FROM THE SHOEMAKER-LEVY 9 IMPACTS ON JUPITER 432
Paul J. Kellogg, Keith Goetz, Steven J. Monson, & Stuart D. Bale

JOINT INSTABILITY OF LATITUDINAL DIFFERENTIAL ROTATION AND TOROIDAL MAGNETIC FIELDS BELOW THE SOLAR CONVECTION ZONE 439
Peter A. Gilman & Peter A. Fox

INVESTIGATING "PRECURSOR FLOWS" IN SOLAR FLARES 455
Elizabeth K. Newton

BEAM-GENERATED PLASMA TURBULENCE DURING SOLAR FLARES 463
Alberto M. Vásquez & Daniel O. Gómez

MEASUREMENTS OF FLOW SPEEDS IN THE CORONA BETWEEN 2 AND 30 $R_\odot$ 472
N. R. Sheeley, Jr., Y.-M. Wang, S. H. Hawley, G. E. Brueckner, K. P. Dere, R. A. Howard, M. J. Koomen, C. M. Korendyke, D. J. Michels, S. E. Paswaters, D. G. Socker, O. C. St. Cyr, D. Wang, P. L. Lamy, A. Llebaria, R. Schwenn, G. M. Simnett, S. Plunkett, & D. A. Biesecker

PROPERTIES OF THE SMALLEST SOLAR MAGNETIC ELEMENTS. II. OBSERVATIONS VERSUS HOT WALL MODELS OF FACULAE 479
K. P. Topka, T. D. Tarbell, & A. M. Title

THEORETICAL AND LABORATORY STUDIES ON THE INTERACTION OF COSMIC-RAY PARTICLES WITH INTERSTELLAR ICES. II. FORMATION OF ATOMIC AND MOLECULAR HYDROGEN IN FROZEN ORGANIC MOLECULES 487
R. I. Kaiser, G. Eich, A. Gabrysch, & K. Roessler

THE FeH WING-FORD BAND IN SPECTRA OF M STARS 499
Ricardo P. Schiavon, B. Barbuy, & Pattan D. Singh

ERRATUM

Monitoring the Solar Temperature: Spectroscopic Temperature Variations of the Sun 511
David F. Gray & William C. Livingston

ABSTRACTS OF THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 1997 AUGUST

Galaxy Morphology without Classification: Self-organizing Maps 512
Avi Naim, Kavan U. Ratnatunga, & Richard E. Griffiths

Luminous Infrared Galaxies II. NGC 4945: A Nearby Obscured Starburst/Seyfert Nucleus 512
Sebastian Lípari, Zlatan Tsvetanov, & F. Macchetto

High Signal-to-Noise Echelle Spectroscopy of Quasi-stellar Object Absorption-Line Systems with Metals in the Direction of HS 1700+6416 512
Todd M. Tripp, Limin Lu, & Blair D. Savage

Hγ and Hδ Absorption Features in Stars and Stellar Populations 513
Guy Worthey & D. L. Ottaviani

The High-Resolution *IRAS* Galaxy Atlas 513
Yu Cao, Susan Terebey, Thomas A. Prince, & Charles A. Beichman

Far-Infrared Spectroscopy of C II and High-*J* CO Emission from Warm Molecular Gas in NGC 3576 514
R. T. Boreiko & A. L. Betz

Early-Type Stars in the Galactic Halo from the Palomar-Green Survey. I. A Sample of Evolved, Low-Mass Stars 514
N. C. Hambly, W. R. J. Rolleston, F. P. Keenan, P. L. Dufton, & R. A. Saffer

A Near-Infrared Imaging Survey of the ρ Ophiuchi Cloud Core 514
Mary Barsony, Scott J. Kenyon, Elizabeth A. Lada, & Peter J. Teuben

r-Process Surveys 515
Bradley S. Meyer & Jason S. Brown

Medium-Resolution Spectra of Normal Stars in the *K* Band 515
L. Wallace & K. Hinkle

Collision Strengths for Electron Collisional Excitation of S II 515
S. S. Tayal

CONTENTS

1997 AUGUST 1, Number 2

Page

USING SUNYAEV-ZELDOVICH INFRARED EXPERIMENT (SuZIE) ARCMINUTE-SCALE COSMIC MICROWAVE BACKGROUND ANISOTROPY DATA TO PROBE OPEN AND FLAT Λ COLD DARK MATTER COSMOGONIES 517
K. Ganga, Bharat Ratra, S. E. Church, Naoshi Sugiyama, P. A. R. Ade, W. L. Holzapfel, P. D. Mauskopf, & A. E. Lange

AN UPPER LIMIT TO ARCMINUTE-SCALE ANISOTROPY IN THE COSMIC MICROWAVE BACKGROUND RADIATION AT 142 GHz 523
S. E. Church, K. M. Ganga, P. A. R. Ade, W. L. Holzapfel, P. D. Mauskopf, T. M. Wilbanks, & A. E. Lange

FAINT *K*-SELECTED GALAXY CORRELATIONS AND CLUSTERING EVOLUTION 538
R. G. Carlberg, Lennox L. Cowie, Antoinette Songaila, & Esther M. Hu

BENDING OF LIGHT BY GRAVITY WAVES 545
Nick Kaiser & Andrew Jaffe

THE EFFECTS OF AMPLIFICATION BIAS IN GRAVITATIONAL MICROLENSING EXPERIMENTS 555
Cheongho Han

COSMOLOGICAL MODEL PREDICTIONS FOR WEAK LENSING: LINEAR AND NONLINEAR REGIMES 560
Bhuvnesh Jain & Uroš Seljak

LENSING EFFECTS ON THE PROTOGALAXY CANDIDATE cB58 AND THEIR IMPLICATIONS FOR THE COSMOLOGICAL CONSTANT 574
T. Hamana, M. Hattori, H. Ebeling, J. P. Henry, T. Futamase, & Y. Shioya

LBDS 53W091: AN OLD, RED GALAXY AT $z = 1.552$ 581
Hyron Spinrad, Arjun Dey, Daniel Stern, James Dunlop, John Peacock, Paul Jimenez, & Rogier Windhorst

A FEEDBACK MODEL FOR RADIO SOURCES FUELED BY COOLING FLOWS 602
Wallace Tucker & Laurence P. David

SMOOTHED PARTICLE HYDRODYNAMICS WITH GRAPE AND PARALLEL VIRTUAL MACHINE 608
Naohito Nakasato, Masao Mori, & Ken'ichi Nomoto

ESTIMATION OF THE SPACE DENSITY OF LOW SURFACE BRIGHTNESS GALAXIES 618
F. H. Briggs

JET OUTBURSTS FROM FAST ACCRETION IN A DISK WITH ZEBRA-STRIPE MAGNETIC FIELD 628
R. V. E. Lovelace, W. I. Newman, & M. M. Romanova

THE TEMPERATURE AND OPACITY OF ATOMIC HYDROGEN IN SPIRAL GALAXIES 637
Robert Braun

THE AVERAGE PROPERTIES OF THE DENSE MOLECULAR GAS IN GALAXIES 656
Timothy A. D. Paglione, James M. Jackson, & Sumio Ishizuki

MOLECULAR GAS IN THE POSTSTARBURST GALAXY NGC 7331 664
T. Tosaki & Y. Shioya

INTRINSIC PROPERTIES OF THE $\langle z \rangle = 2.7$ Lyα FOREST FROM KECK SPECTRA OF QUASAR HS 1946+7658 672
David Kirkman & David Tytler

MULTIPLE CO TRANSITIONS, C I, AND HCN FROM THE CLOVERLEAF QUASAR 695
Richard Barvainis, Philip Maloney, Robert Antonucci, & Danielle Alloin

ARCSECOND IMAGING OF CO EMISSION IN THE NUCLEUS OF ARP 220 702
N. Z. Scoville, M. S. Yun, & P. M. Bryant

THE HALO BEAMING MODEL FOR GAMMA-RAY BURSTS 720
R. C. Duncan & Hui Li

WHITE DWARFS IN GLOBULAR CLUSTERS: *HUBBLE SPACE TELESCOPE* OBSERVATIONS OF M4 741
Harvey B. Richer, Gregory G. Fahlman, Rodrigo A. Ibata, Carlton Pryor, Roger A. Bell, Michael Bolte, Howard E. Bond, William E. Harris, James E. Hesser, Steve Holland, Nicholas Ivanans, Georgi Mandushev, Peter B. Stetson, & Matt A. Wood

KINEMATICAL STRUCTURE OF THE LOCAL INTERSTELLAR MEDIUM: THE GALACTIC CENTER HEMISPHERE 761
Ricardo Génova, John E. Beckman, Stuart Bowyer, & Thomas Spicer

CAN COMPOSITE FLUFFY DUST PARTICLES SOLVE THE INTERSTELLAR CARBON CRISIS? 779
Eli Dwek

Page

MOLECULAR HYDROGEN IN DIFFUSE INTERSTELLAR CLOUDS OF ARBITRARY THREE-DIMENSIONAL GEOMETRY 785
Marco Spaans & David A. Neufeld

NUMERICAL SIMULATIONS OF ASTROPHYSICAL JETS FROM KEPLERIAN DISKS. II. EPISODIC OUTFLOWS 794
Rachid Ouyed & Ralph E. Pudritz

ON THE RELATIVE IMPORTANCE OF PHOTOEVAPORATIVE AND HYDRODYNAMIC EFFECTS IN THE ABLATION OF SELF-GRAVITATING GLOBULES IN COMPACT H II REGIONS 810
S. J. Arthur & S. Lizano

ATOMIC PHYSICS WITH THE GODDARD HIGH RESOLUTION SPECTROGRAPH ON THE *HUBBLE SPACE TELESCOPE.* III. OSCILLATOR STRENGTHS FOR NEUTRAL CARBON 820
J. Zsargó, S. R. Federman, & Jason A. Cardelli

X-RAY IMAGING AND SPECTROSCOPY OF THE SUPERNOVA REMNANT CTB 109 AND ITS ASSOCIATED PULSAR 1E 2259+586 828
Jeonghee Rho & R. Petre

TRANSIENTS AMONG BINARIES WITH EVOLVED LOW-MASS COMPANIONS 844
A. R. King, J. Frank, U. Kolb, & H. Ritter

THE EVOLUTION OF THE OPTICALLY THICK ACCRETION DISK IN NOVA MUSCAE 848
Ranjeev Misra & Fulvio Melia

POLAR MAGNETIC ACTIVITY AND SPIN-DOWN ON THE LOWER MAIN SEQUENCE 855
D. L. Buzasi

SINGLE CLOSE ENCOUNTERS DO NOT MAKE ECCENTRIC PLANETARY ORBITS 862
J. I. Katz

RESONANT TIDES IN CLOSE ORBITING PLANETS 866
S. H. Lubow, C. A. Tout, & M. Livio

HUBBLE SPACE TELESCOPE ULTRAVIOLET SPECTROSCOPY OF TWO HOT WHITE DWARFS 871
J. B. Holberg, M. A. Barstow, T. Lanz, & I. Hubeny

A CRITICAL STUDY OF MOLECULAR PHOTODISSOCIATION AND CHON GRAIN SOURCES FOR COMETARY C_2 879
Michael R. Combi & Uwe Fink

SKYMAPPING WITH OSSE VIA THE MEAN FIELD ANNEALING PIXON TECHNIQUE 891
D. D. Dixon, T. O. Tümer, A. D. Zych, L. X. Cheng, W. N. Johnson, J. D. Kurfess, R. K. Piña, R. C. Puetter, W. R. Purcell, & W. A. Wheaton

THE VECTOR MAGNETIC FIELDS AND THERMODYNAMICS OF SUNSPOT LIGHT BRIDGES: THE CASE FOR FIELD-FREE DISRUPTIONS IN SUNSPOTS 900
K. D. Leka

STATISTICS OF FLUCTUATIONS IN THE SOLAR SOFT X-RAY EMISSION 920
S. UeNo, S. Mineshige, H. Negoro, K. Shibata, & H. S. Hudson

A SUPERHOT FLARE OBSERVED BY *YOHKOH* 927
Nariaki Nitta & Kentaro Yaji

SEISMIC TESTS OF THE SUN'S INTERIOR STRUCTURE, COMPOSITION, AND AGE, AND IMPLICATIONS FOR SOLAR NEUTRINOS 937
D. B. Guenther & P. Demarque

A STOCHASTIC MODEL OF THE SOLAR ATMOSPHERE 960
Yeming Gu, John T. Jefferies, Charles Lindsey, & E. H. Avrett

ELECTRON EXCITATION CROSS SECTIONS FOR THE S II TRANSITIONS $3s^23p^3\,{}^4S^o \rightarrow 3s^23p^3\,{}^2D^o$, ${}^2P^o$, AND $3s3p^4\,{}^4P$ 979
C. Liao, Steven J. Smith, D. Hitz, A. Chutjian, & S. S. Tayal

ERRATA

Destruction of Molecular Hydrogen during Cosmological Reionization 985
Zoltán Haiman, Martin J. Rees, & Abraham Loeb

The Age of the Oldest Globular Clusters 986
M. Salaris, S. Degl'Innocenti, & A. Weiss

NEW INSTRUCTIONS TO AUTHORS—REVISED 1997 JUNE 1 i